

CA1  
MT 76  
- A66

Government  
Publication



CANADA

# NATIONAL ENERGY BOARD REASONS FOR DECISION

In the Matter of an Application under  
the National Energy Board Act  
of

Westcoast Transmission Company Limited

July 1980

*+ enate*





ERRATA

National Energy Board

Reasons for Decision

In the matter of an application under  
the National Energy Board Act  
of  
Westcoast Transmission Company Limited  
July 1980

1. Page 16, Line 7 - change " $70.8 \times 10^3 \text{m}^3$ "  
to " $70.8 \times 10^6 \text{m}^3$ ".
2. Page 16, Line 8 - change " $764.9 \times 10^3 \text{m}^3$ "  
to " $764.9 \times 10^6 \text{m}^3$ ".
3. Page 29, Line 20 - change " $70.8 \times 10^3 \text{m}^3$ "  
to " $70.8 \times 10^6 \text{m}^3$ ".
4. Page 29, Line 21 - change " $42.5 \times 10^3 \text{m}^3$ "  
to " $42.5 \times 10^6 \text{m}^3$ ".





NATIONAL ENERGY BOARD

REASONS FOR DECISION

In the matter of an application under  
the National Energy Board Act  
of

WESTCOAST TRANSMISSION COMPANY LIMITED

July 1980

Ce rapport est publié  
dans les deux langues  
officielles.



NATIONAL ENERGY BOARD

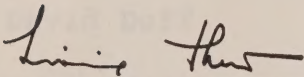
In the Matter of the Application Under  
the National Energy Board Act

of

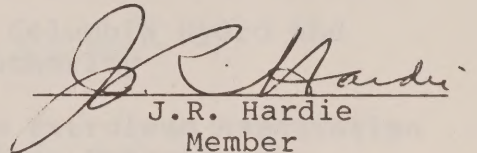
WESTCOAST TRANSMISSION COMPANY LIMITED

July 1980

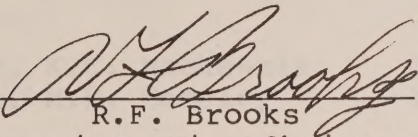
The Board, having received and considered the evidence adduced and the submissions made at the hearing of this application, and the report of the Presiding Member, Mr. Jacques Farmer, made pursuant to section 14 of the Act, and on the basis of that evidence, those submissions and that report having satisfied itself with regard to all considerations that appear to it to be relevant, hereby adopts that report as the statement of its findings and its decision on the application.



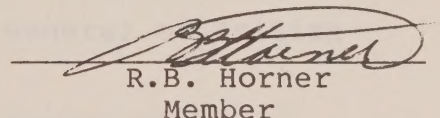
L.M. Thur  
Associate Vice-Chairman



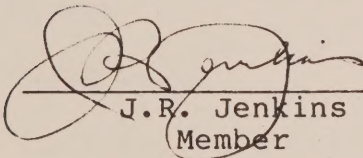
J.R. Hardie  
Member



R.F. Brooks  
Associate Vice-Chairman



R.B. Horner  
Member



J.R. Jenkins  
Member

NATIONAL ENERGY BOARD

In the Matter of the Application under  
The National Energy Board Act

of

WESTCOAST TRANSMISSION COMPANY LIMITED

July 1970

The Board, having received and considered the evidence  
adduced and the submissions made at the hearing of this  
application, and the report of the Technical Panel, Mr.  
Jedrej Barrow, the pursuant to section 16 of the Act,  
and on the basis of that evidence, finds that the  
that report having satisfied itself with regard to all  
considerations that appear to it to be relevant, hereby  
adopts that report as the statement of the findings and

Digitized by the Internet Archive  
in 2023 with funding from  
University of Toronto



NATIONAL ENERGY BOARD

IN THE MATTER OF an application by Westcoast Transmission Company for an Order pursuant to Section 49 of the National Energy Act.

(File No. 1555-W5-71)

Heard at Vancouver, British Columbia on 24 and 25 June 1980.

BEFORE:

J. Farmer as Presiding Member duly appointed by the Board for that purpose in accordance with section 14 of the National Energy Board Act.

APPEARANCES

Mr. R.J. Gibbs, Q.C.	)	Westcoast Transmission
Mr. C.D. Sanderson	)	Company Limited
Mr. Rodney A. Snow	)	British Columbia Petroleum Corporation
Mr. David Duff	)	British Columbia Hydro and Power Authority
Mr. John B. McWilliams	)	Canadian Petroleum Association
Mr. J.J. Camp	)	Independent Petroleum Association of Canada
Mr. K.C. Mackenzie	)	Attorney General of British Columbia
Mr. M.M. Moseley	)	
Miss Sandra Fraser	)	National Energy Board

CONTENTS

	<u>Page</u>
RECITAL AND APPEARANCES	(i)
CONTENTS	(ii)
ABBREVIATIONS	(iii)
The Application	1
Interventions	3
Reserves and Deliverability	5
Domestic Markets	6
Export Markets	8
1) Sales Forecast	8
2) Off-System Sales	11
3) Winter Sales	14
4) Available Storage Facilities	16
Facilities	20
1) Pipeline Design	20
2) Estimated Cost of the Proposed Facilities	22
Right-of-Way Matters	24
Environmental Aspects	25
Economic Evaluation	28
Canadian Content	30
Financing	31
Summary of Findings and Conclusions	32
Recommendation	35

Appendices

1. Map - Westcoast Transmission Company Limited  
1980 Mainline Looping Project
2. Table showing location of proposed pipeline loops
3. Terms and Conditions of Order

ABBREVIATIONS

"the Act"	- National Energy Board Act
"AGBC"	- Attorney General of British Columbia
"the Board"	- National Energy Board
"B.C. Hydro"	- British Columbia Hydro and Power Authority
"BCPC"	- British Columbia Petroleum Corporation
"CPA"	- Canadian Petroleum Association
"Columbia"	- Columbia Gas Development of Canada Ltd.
"DOE"	- Department of Energy (U.S.)
"El Paso"	- El Paso Natural Gas Company
"EJ"	- Exajoule ( $10^{18}$ joules)
"ERA"	- Economic Regulatory Agency
"FERC"	- Federal Energy Regulatory Commission
"GJ"	- Gigajoule ( $10^9$ joules)
"IPAC"	- Independent Petroleum Association of Canada
"km"	- Kilometre
"mm"	- Millimetre
"MMBtu"	- One million British Thermal Units
"M.P."	- Milepost
"Northwest"	- Northwest Pipeline Corporation
"Pacific Interstate"	- Pacific Interstate Transmission Company
"Pan-Alberta"	- Pan-Alberta Gas Ltd.
"Southwest"	- Southwest Gas Corporation
"Westcoast" or "the Applicant"	- Westcoast Transmission Company Limited





### THE APPLICATION

The Applicant, Westcoast Transmission Company Limited, owns and operates a pipeline for the transmission of natural gas produced in the Provinces of British Columbia and Alberta, the Yukon Territory, and the Northwest Territories, for sale to customers in Canada and the United States.

By an application dated 11 March 1980, Westcoast applied to the Board for an Order under Section 49 of the National Energy Board Act exempting it from the provisions of Sections 25 to 29 inclusive of the Act. This exemption would permit Westcoast to construct 37.016 km of 914.4 mm O.D. pipeline at five locations on its existing 762.0 mm O.D. mainline. The facilities are shown in the map attached as Appendix 1 to this report and are described in detail in the application filed with the Board. The capital cost of the project is estimated at \$21,582,000.

Westcoast originally proposed to commence construction of the pipeline facilities upon Board approval with a final projected completion date of 30 September, 1980. At the hearing, the Company amended its proposed construction schedule to show a completion date of 1 November 1980 and the Applicant stated that in order to meet the construction schedule, Board approval would be required by late July 1980.

The Applicant stated that the proposed facilities are required to provide the capacity to enable it to deliver the contractual requirements of its customers in 1981 and 1982. It stated that the proposed facilities would increase the flexibility and security on the pipeline system and would help the overall gas-purchasing situation in British Columbia. Completion of the loop between Compressor Stations 2 and 2B would facilitate relocating the mainline, which is necessary due to the proposed relocation of the John Hart Highway.

The Board, by its Order No. GH-5-80, dated 15 May 1980, set the application down for hearing in Vancouver, starting 24 June 1980. The hearing concluded on 25 June 1980.



### INTERVENTIONS

Five interested parties intervened in the application and their views are summarized as follows:

The Attorney General of British Columbia stated that it was interested in the revenue received by the Province of British Columbia through the British Columbia Petroleum Corporation and the rates paid for natural gas by consumers within British Columbia, both of which might be affected by the granting of the application. In the opinion of the AGBC, the evidence presented did not indicate sufficient volumes of increased sales to justify the expenditures involved in looping at this time. Therefore, because of the uncertain export market outlook, the AGBC did not support Westcoast's application. The AGBC did say, however, that the issue appeared to be one of timing.

The British Columbia Petroleum Corporation stated that it supported the position taken by the AGBC and urged that the application be denied at this time.

The British Columbia Hydro and Power Authority intervened as a distributor of natural gas in the Province of British Columbia. B.C. Hydro's position was that no additional looping by Westcoast this year was justified.

The Canadian Petroleum Association intervened as the representative of a large number of gas producers operating in Canada. The CPA stated that while there was some uncertainty regarding the actual volumes required by the export markets served by Westcoast, it supported the application on the grounds that it would provide further incentive for gas exploration and development. Construction of the proposed facilities would enable Westcoast to meet its contractual obligations and would confirm Canada's reliability as a source of supply for United States markets.

The Independent Petroleum Association of Canada intervened because many of its members in B.C. produce gas which is moved to market through the Westcoast facilities. IPAC supported the application because the proposed facilities would enable Westcoast to meet its contractual obligations with its United States customer and would free more surplus gas.

### RESERVES AND DELIVERABILITY

The application showed that as of 1 January 1980, there were a total of  $232.4 \times 10^9 \text{ m}^3$  of remaining marketable gas reserves in Westcoast's supply area. These reserves, having an energy equivalent of 8.947 exajoules (EJ), include both the controlled and non-controlled reserves in the supply area. When its Pan-Alberta contracts were added, Westcoast showed total remaining gas reserves of 9.4 EJ.

Westcoast's annual deliverability forecast included deliverability from connected and non-connected reserves, its Pan-Alberta contracted reserves, Columbia's Kotaneelee reserves and trend gas reserves additions. The Company's supply-requirements balance using this forecast showed annual deficiencies for the years 1984 through 1988. However, Westcoast stated that it did not expect these short-falls to occur due to its flexibility in connecting presently unconnected reserves and future reserves additions, if the need arose.

### Conclusions

The Applicant's estimate of reserves is reasonable in light of the Board's current estimate of 8.6 EJ of remaining reserves in the Westcoast supply area as of 1 January 1980, and I am satisfied that Westcoast has adequate supply to meet its requirements.



### DOMESTIC MARKETS

Westcoast provided a long-term projection of the natural gas requirements of its domestic customers through to the year 1997. This forecast of deliveries by Westcoast to utilities in British Columbia indicated that these requirements, including Westcoast's compressor fuel and losses, were expected to increase from an estimated annual level of  $4.8 \times 10^9 \text{ m}^3$  in 1980 to  $9.5 \times 10^9 \text{ m}^3$  by 1997. This averaged to an annual growth rate of approximately 4.1 percent over the forecast period.

Over the short term, annual domestic requirements were projected to increase by approximately  $0.2 \times 10^9 \text{ m}^3$ , or about 4 percent, in each of the years 1981 and 1982.

Westcoast's forecast was developed by projecting the requirements of the natural gas distributors in the province for each of the residential, commercial and industrial market sectors. This forecast included estimates of additional sales of natural gas that were expected to result from the extension of natural gas service to Vancouver Island commencing in 1983.

The forecast also made provision for the requirements of a methanol plant proposed for the City of Kitimat, in the distribution area of Pacific Northern Gas. Two such plants were proposed for the area, but Westcoast included only

one plant in its forecast and assumed that such additional requirements would also begin in 1983.

Westcoast representatives testified that sales of natural gas not included in the forecast could take place based on recent statements by the Government of British Columbia encouraging additional use of natural gas in the Province. In fact, Westcoast indicated that the provincial government has directed B.C. Hydro to embark on a campaign to convert as many space-heating customers as possible from oil to natural gas.

Westcoast testified that with increased capacity in its system it would not have to curtail its domestic customers to their nominated volumes to the extent that has been necessary in past years. This would mean that "interruptible" customers would not have to turn to alternative fuels, which in most cases would be residual fuel oil.

### Conclusions

The domestic requirements for natural gas as projected by Westcoast appear to be reasonable.

## EXPORT MARKETS

This section deals with export markets and discusses sales forecast, winter sales, off-system sales and available storage facilities. It should be noted that Westcoast supplies natural gas to the Northwest Pipeline Corporation which makes sales to distributors in the Pacific northwest area. In addition, Northwest makes off-system sales to Pacific Interstate Transmission and Southwest Gas.

### 1) Sales Forecast

Westcoast provided two scenarios of sales to the Northwest Pipeline Corporation. In the first case, Westcoast took actual sales for the year 1979, less off-system sales to Pacific Interstate, and added sales of  $2832 \times 10^3 \text{ m}^3$  a day for six months for the Beaver power plant near Portland, Oregon. Westcoast indicated that although Portland General Electric (the supplier to the Beaver Power Plant) had filed an application with the U.S. Department of the Environment for an exemption allowing it to use natural gas, approval had not yet been received.

Sales under the first case were increased by 1.3 percent a year to account for the estimated growth on Northwest's system.

In the second case, Westcoast took 60 percent of Northwest's entire system's projected requirements as the volume to be supplied by Westcoast to the Pacific Northwest area. Off-system sales to Pacific Interstate were again excluded.



During the cross-examination of witnesses for Northwest presented by Westcoast, the Attorney General of British Columbia filed as an exhibit Form 16 which is a report filed with the U.S. Federal Energy Regulatory Commission showing Northwest's actual and projected sales for the operating years 1979-80 and 1980-81 respectively. AGBC pointed out that the projected import requirements shown in Form 16 were substantially lower than those provided by Westcoast. Northwest explained the wide difference by stating that the Form 16 report to the FERC reflected only certified sales and curtailments resulting in shortfall at the Sumas, B.C. delivery point. Northwest further stated that the Form 16 forecasts are usually below the actual sales, because their purpose was to project the worst case for rates. Their report excluded interruptible industrial sales, off-system sales, sales to power generating plants and expanded sales under the winter service rate schedule. In a response to a deficiency letter from the Board, Westcoast showed an under- delivery to Northwest of  $12.9 \times 10^6 \text{ m}^3$  in December 1979 and  $31.2 \times 10^6 \text{ m}^3$  in January 1980; Northwest had forecasted in the filing with the FERC a December shortfall of  $1.4 \times 10^6 \text{ m}^3$  and a January shortfall of  $19.7 \times 10^6 \text{ m}^3$ .

The Northwest witness also noted that, in a separate document prepared for the U.S. Economic Regulatory Agency, it had shown that  $1218.1 \times 10^6 \text{ m}^3$  of sales had been lost

and that another  $2974.4 \times 10^6 \text{ m}^3$  was estimated to be vulnerable as a result of the Canadian natural gas export price increase from \$3.22 (U.S.)/gigajoule (GJ) (\$3.45 (U.S.) per MMBtu) to \$4.17(U.S.)/GJ (\$4.47 (U.S.) per MMBtu).

Westcoast said that, because of insufficient capacity on its existing pipeline system on cold winter days, it periodically had to curtail deliveries to Northwest in order to provide enough gas for its Canadian customers. Westcoast was therefore unable to guarantee the supply of contract volumes of  $22\,922 \times 10^3 \text{ m}^3$  a day to be exported under Licence GL-41, as provided in the Fourth Service Agreement between Northwest and Westcoast. Furthermore, Westcoast indicated that pipeline capacity deficiencies fall entirely upon the export customer, and, in the past, under-deliveries to Northwest have amounted to as much as  $1416.4 \times 10^3 \text{ m}^3$  a day.

Westcoast admitted that it sold only half its forecast summer volumes of gas to Northwest during April and May 1980, attributing the reduced sales to the impact of the current export price, withdrawals of gas from storage, the impact of the U.S. recession, the low price of residual fuel oil, the shutdown of certain wood products industries and as a result of the passage of the U.S. Natural Gas Policy Act of 1978, the availability of additional U.S. gas. Despite these facts, Westcoast maintained that Northwest would nominate the maximum volume of  $22\,922.9 \times 10^3 \text{ m}^3$  a day to be

exported under GL-41 during the period November 1980 to March 1981 provided the additional facilities were installed in the Westcoast system.

2) Off-System Sales

a) Pacific Interstate Transmission

The off-system sales to Pacific Interstate by Northwest were  $966.0 \times 10^6 \text{ m}^3$  for the year ended 31 March 1980 and the projected sales for the year 1980-81 were  $833.0 \times 10^6 \text{ m}^3$ . Northwest indicated that Pacific Interstate would not require any additional gas from Northwest until September, 1980. However, if the winter in the El Paso market area were to be very cold, El Paso could experience severe curtailments or be in a shortfall position, which would restrict the volume of gas El Paso could supply Pacific Interstate. In these circumstances, Pacific Interstate would likely nominate off-system sales of up to  $5666.0 \times 10^3 \text{ m}^3$  a day from Northwest.

Northwest stated that sales to Pacific Interstate could be made during the winter period through an arrangement by which gas could be displaced at Ignacio, Colorado. By such an arrangement, El Paso would supply gas to Pacific Interstate while Northwest could supply El Paso an equivalent amount of gas. Northwest stated that such a winter-time arrangement would be more convenient to it because then it would not have to move gas all the way down the system.



Evidence provided to the Board in March 1980 at the Pan-Alberta Export hearing indicated that Pan-Alberta export volumes, carried on the prebuild Western Leg of the Northern Pipeline, could interfere with off-system sales to El Paso because of pipeline capacity constraints in El Paso's system. Northwest stated that there would now be sufficient capacity in the Western Leg to move the projected gas volumes, including the El Paso volumes, other off-system sales and/or "311B" best efforts gas. This "311B" gas is interstate gas from Louisiana, Oklahoma and Texas and is currently sold in El Paso's market area for under \$2.80 on a best effort basis.

b) Southwest Gas

Northwest had estimated on Form 16 that its off-system sales to Southwest Gas would be  $136.0 \times 10^6 \text{ m}^3$  for the year ending 31 March 1981, compared to some  $170.0 \times 10^6 \text{ m}^3$  in 1979-80. However, Northwest stated that Southwest had been refusing to pay the recent higher price for Canadian gas and planned on curtailing its purchases. Under the terms of its rate schedule, Southwest is able to encourage its customers to use "311B" natural gas, thereby reducing Canadian gas purchases.

c) El Paso Natural Gas Company

A sale by Westcoast to El Paso of  $1699.7 \times 10^3 \text{ m}^3$  a day firm basis and  $1416.4 \times 10^3 \text{ m}^3$  a day on best efforts basis, to start on 1 November 1980, was approved

by the Board in November 1979 following Phase I of the 1979 Omnibus hearing. Northwest testified that El Paso had yet to apply to the U.S. regulatory authorities for approval of the import of this gas. However, El Paso has filed a comprehensive application for additional facilities. If the facilities are approved, El Paso could accommodate the proposed off-system sale by Westcoast of  $1\,699.7 \times 10^3 \text{ m}^3$  a day and connect El Paso with the Northwest system in New Mexico. Under cross-examination it was established that El Paso would not need the proposed off-system gas for at least two years because of the availability of interstate gas. Westcoast indicated that El Paso was currently purchasing  $19\,829.5 \times 10^3 \text{ m}^3$  a day of interstate "311B" gas.

Northwest stated that it has not yet entered into a formal transportation contract with El Paso but expected no opposition as long as the facility costs were to be incrementally charged to El Paso. The volumes of gas to be delivered to El Paso would be subject to FERC's recent ruling on take-or-pay provisions in gas sales contracts applicable to gas to be carried on prebuilt portions of the Alaskan Natural Gas Transportation System. These rulings, if applied to the El Paso's sales, would establish a minimum level of take, but would not prevent El Paso from taking more gas if warranted by market conditions.

3) Winter Sales

Although the summer sales to Northwest have been declining, evidence presented at the hearing indicated that market patterns were changing. This change was ascribed to the possibility of improved winter sales because of electric power capacity limitations, the prospects of new gas sales to the Beaver power plant, expansion of California markets and the narrowing of the differential between the rolled-in price of gas and the price of competing fuels in Northwest's market area.

Westcoast indicated that the traditionally large industrial customers with interruptible service in the U.S. Pacific Northwest area, who normally purchased gas during the summer months, had not been buying gas from their suppliers primarily due to the high price of Canadian gas. These industrial customers had switched to alternative fuels, mainly high sulphur residual fuel oil, which was selling between \$2.66 (U.S.)/GJ to \$2.96 (U.S.)/GJ.

Northwest stated that the distributors in the Pacific Northwest area have launched a very aggressive marketing program to attach high priority gas customers in order to take advantage of the current shortage of electricity in that area. The attachment of such loads would result in an increase in the volume of gas to be delivered under Licence GL-41 during the winter heating season. Northwest believed this marketing



program would succeed because of measures instituted to discourage further growth in electricity demand. The Company noted that the various electric commissions in Oregon, Washington and Idaho have either levied, or were looking into the possibility of levying, a connection charge for new residential customers for electric space and water heating service. The Company said that the State of Idaho had already instituted a connection charge of \$50 per kilowatt for the northern parts of Idaho in the service area of one electric company. The State of Oregon recently concluded a public hearing on this matter, and Northwest had reaffirmed to the State Board its commitment to meet its contractual obligations to accommodate increasing natural gas sales in the residential and commercial markets. The State of Washington was said to be reviewing its policy.

Northwest stated that gas competes favourably with electricity in areas where private or corporately-owned companies provide the electrical service. In those Public Utility Districts served by government-owned utilities, gas could not compete. As an example, Northwest compared the Portland General Electric rate for residential customers of \$6.06 (U.S.)/GJ to the \$4.66 (U.S.)/GJ for gas in publicly-owned utility areas.

Northwest stated that during 1980-81, an additional  $708.2 \times 10^3 \text{ m}^3$  of gas a day for approximately 100 days

could be sold as winter service to high priority users (residential, commercial and small industrials). Beginning with the 1981-82 heating season, it would provide additional volumes of  $2\,124.6 \times 10^3 \text{ m}^3$  a day for 150 days to Colorado Interstate Gas Company and  $708.2 \times 10^3 \text{ m}^3$  a day for 100 days to Mountain Fuel. In total, it estimated it would provide  $70.8 \times 10^3 \text{ m}^3$  on a seasonal basis during 1980-81 and  $764.9 \times 10^3 \text{ m}^3$  during 1981-82, primarily in the States of Colorado and Utah.

Northwest noted that its new winter service rate for high priority users was based on the rolled-in cost of gas plus the cost of transportation on the main transmission line plus incremental storage costs. The rate was only available for the five-month winter period thereby creating a new pattern for gas sales.

#### (4) Available Storage Facilities

Northwest indicated that the  $90.9 \times 10^6 \text{ m}^3$  shortfall from Westcoast during the last heating season was made up from other sources, primarily from the available storage facilities. Furthermore, Northwest stated that due to the greater flexibility in their storage facilities, and because of winter service rates, sales for the last heating season increased by approximately  $212.4 \times 10^6 \text{ m}^3$ .

Northwest indicated that the deliverability and working level of storage gas currently available to it from its three storage facilities was as follows:

	Seasonal ( $10^6 \text{ m}^3$ )	Daily ( $10^3 \text{ m}^3$ )
1. Clay Basin, Utah (storage service purchased from Mountain Fuel Resources)	566.5	4 249.2
2. Jackson Prairie Storage Field, Chehalis, Washington	334.3	9 206.5
3. Plymouth, Washington, LNG Plant	68.0	8 498.4

As an alternative to looping, Northwest had considered the expansion of storage facilities. However, the costs were such that it was not felt to be a viable alternative. Northwest believed that, on average, an expansion of storage capacity would cost about \$0.93 (U.S.)/GJ (withdrawal and injection) in addition to drilling, compression and other hardware costs. It noted that, for each  $28.3 \text{ m}^3$  of working gas storage capacity added, an equivalent volume would be required as cushion gas. Coupled with the current export price of \$4.17 (U.S.)/GJ, or \$4.47 (U.S.) per MMBtu, the total cost for stored gas could reach \$5.13 (U.S.)/GJ or \$5.50 (U.S.) per MMBtu.

### Conclusions

I am of the opinion that although there is a possibility that total gas to be exported under Licence GL-41 during 1980-81 could be less than the sales in 1979-80, there is a change in pattern in winter sales to residential, commercial and small industrial customers which will occur, provided the proper facilities are installed on Westcoast's system.



I agree with the Applicant that the winter service sales will proceed gradually and will be relatively modest in the beginning. As seen in the evidence, an increase in sales will occur mostly during the five-month winter season, and I believe that this and other relevant circumstances should be taken into account now.

The assumption made by the Applicant regarding gas sales to the Beaver power plant referred to in the Case 1 forecast is valid under the present circumstances. The prospects of new gas sales of up to  $2.8 \times 10^6 \text{ m}^3$  a day to the Beaver power plant for the next five years provide a note of optimism for recovery in the volume of sales to Northwest.

I also conclude that if El Paso continues to get less expensive "311B" interstate gas, the off-system sale to El Paso will not materialize as contemplated by the Applicant. However, I believe that prospects for new winter sales to Pacific Interstate will help to offset the loss of summer sales. I also note a change in the pattern of marketing off-system sales, in that summer sales of Canadian gas may be lower than past levels, while winter sales will increase. I also believe that, over time, the differential between the rolled-in price of gas on the Northwest system and the price of competing fuels will narrow, contributing to improved marketability of Canadian gas exports in this area.

Weighing the evidence on markets, I believe that for Westcoast to cope with the increased domestic demand, it is necessary to install additional facilities on its mainline system if it is to assure a continuous delivery of  $22\,922.9 \times 10^3 \text{ m}^3$  a day to Northwest during the winter months.

Based on the analysis of Northwest's demand forecast, I conclude that there will be at least 30 days during the winter period when Northwest would require a guaranteed delivery of  $22\,922.9 \times 10^3 \text{ m}^3$  a day from Westcoast. This 30-day period would generate sufficient additional revenues to justify the need for the facilities. This is explained in the section of this report entitled Economic Evaluation.

## FACILITIES

### 1) Pipeline Design

The facilities proposed to be constructed consist of 37.016 km of 914.4 mm diameter loops at five locations on Westcoast's main line. (Shown on the map attached as Appendix 1 and in the table attached as Appendix 2 to this report)

According to the application, with the installation of the additional proposed facilities, Westcoast would be able to meet, on a sustained basis, its peak day forecasted sales of  $41\ 052.7 \times 10^3 \text{ m}^3$  a day in 1982. To ensure the continuity of supply, Westcoast has designed its mainline facilities to provide a practical excess capability of 6.8 percent.

In order to increase the reliability and efficiency of its system, the Applicant is in the process of replacing two W-92 gas turbines at Compressor Stations 4A and 6A with two Spey gas turbines derated from 16 000 horsepower at International Standards Organization conditions to about 11 000 horsepower under site conditions. The replacement, which was authorized by the Board in November, 1979, pursuant to Order No. XGM-17-79, would not result in an increase in horsepower available at the two stations.

Under cross-examination, Westcoast stated that it had studied the possibility of upgrading these two Spey units to the

design level of 16 000 horsepower, in order to reduce the amount of loop required. The results of the study indicated that upgrading the unit at Station 4A would not reduce the amount of loop required, while an upgrading of the unit at Station 6A would eliminate approximately 5.5 km of loop. A cost-of-service calculation performed by Westcoast indicated that the average cost of service would be 0.3 cents per Mcf higher for the 37.0 km looping case as opposed to the case of upgrading the Spey unit at Station 6A to 16 000 horsepower. However, the determination of the cost of service would be very sensitive to any increase in the price of fuel.

With regard to the necessity of the proposed loopline between Milepost 104.6 and 112.6, Westcoast indicated that approximately 6.9 km of loop would be required to provide the necessary pipeline capacity, while 2.8 km would be required to facilitate the relocation of Westcoast's mainline as a result of the John Hart Highway reconstruction. Looping between these two mileposts was also required to improve the continuity of public service during periods of excessive pressure drop through the McMahon Gas Processing Plant located at Taylor, British Columbia.



2) Estimated Costs of the Proposed Facilities

In estimating the cost of its proposed facilities, Westcoast used as a guide the as-built cost of its Summit Lake Loop built in 1979, and added a slight adjustment to account for the fact that it was a low bidder who was granted that contract. These estimates were increased by 15 percent to account for an escalation in costs.

The table below summarizes the estimated cost of the facilities.

Westcoast Mainline Looping

Estimated Cost of Facilities

Direct Cost

Land and land rights	\$49,000
Pipeline	\$19,009,000

Indirect Cost

Engineering	\$705,000
Contingency	\$988,000
Allowance for funds used during construction	<u>\$831,000</u>
TOTAL COST	\$21,582,000

### Conclusions

Having considered the evidence presented concerning the domestic and export market requirements forecast by the Applicant, I am satisfied that the facilities as proposed would provide the additional capacity required to move the volumes of gas to both the domestic and export customers for the operating years 1980-81 and 1981-82.

The Westcoast mainline looping project is conventional and the pipeline would be built in areas where Westcoast has had many years experience in constructing and operating similar pipelines. For those reasons I anticipate no major construction difficulties and find the cost estimates to be reasonable.

### RIGHT-OF-WAY MATTERS

Westcoast stated that the proposed 914.4 mm pipeline loops would be located within an existing 30.48 metre right-of-way for the majority of the route. Two exceptions are in the Pine River Loop section and the Hihium Lake Loop section where short diversions would be required. Westcoast indicated that applications for a Crown Grant of Easement for the two diversions were being processed by the Ministry of Lands, Parks and Housing, and approval was being held in abeyance pending project consideration by the Board.

Westcoast testified that the few private landowners affected by the applied for looping have been notified of the proposed construction and were aware of the possibility of an additional line of pipe being installed on their land.

### CONCLUSION

I accept Westcoast's proposal to make use of its existing right-of-way. I am also satisfied that a Crown Grant of Easement for the two diversions could be obtained. If exemption from the provisions of section 29 of the Act were granted, the Applicant, as a condition of any order, should be required to submit level survey plans for the two diversions where new right-of-way is obtained.

### ENVIRONMENTAL ASPECTS

The Applicant submitted an environmental assessment for the proposed 1980 looping program. The report consisted of a description of the physical environment, the biotic environment, and the land use along each pipeline loop. Also included were an assessment of the impact of the proposed pipeline construction on the environment and the plans and procedures to be implemented to mitigate this impact.

Westcoast undertook to direct its contractors, employees and agents to observe to the maximum degree possible the mitigation measures contained in the environmental assessment section of its application. In addition, construction of the pipeline would be subject to the constraints and contingency plans contained in the environmental section of the contracts for the construction of the proposed pipeline.

Westcoast indicated that it did not anticipate any adverse environmental effects as a result of the construction of the proposed facilities.



## Conclusions

I conclude that the environmental impact of the proposed pipeline looping would be minimal. If an order were issued to Westcoast, I would recommend that the Board require Westcoast to comply with its undertakings and environmental protection procedures and to report to the Board on the implementation of those procedures. The Board should be advised concerning erosion control measures at stream crossing sites; construction procedures at Milepost 109.55 on the Pine River Loop to protect the pipeline facilities from river meander migration; construction procedures at Garbitt Creek to maintain a minimum water depth of approximately 60 cm; timber removal procedures on the Williams Lake Loop; and right-of-way clean-up, grooming and revegetation procedures on each loop.

Furthermore, I would recommend that the Board require Westcoast to implement a post-construction monitoring program of the effects of pipeline construction and operation upon the environment and to report to the Board on the results of the monitoring program. An assessment should be made of the success of Westcoast's clean-up and revegetation program, the effectiveness of the erosion control measures implemented at stream crossings, (with particular reference to the Pine River crossings) and of the Pine River stream bank protection and channel widening operation carried out at Milepost 109.55 on the Pine River Loop. Included in the report should be an assessment of the effect of the channel widening on water life and fish resources of the Pine River. Westcoast should report

to the Board annually on the results of the monitoring program. Such post-construction monitoring should be carried out for three years after leave to open has been granted.

### ECONOMIC EVALUATION

Westcoast's economic evaluation estimated the additional revenue which could be gained by the natural gas producers and the BCPC if export sales increased by  $8\,565 \times 10^3$  GJ in 1980 and by  $14\,208 \times 10^3$  GJ in each year during 1981-1989. Westcoast's analysis was based on its export customer taking its (maximum) daily contract volumes during a 120-day period in the winter season each year.

The revenues estimated by Westcoast were based on the export volumes noted above and on an export border price of \$4.17 (U.S.)/GJ (\$4.47 (U.S.) per MMBtu) in 1980, escalating at six percent a year for the remaining nine years. The Westcoast cost of service and gas purchases were subtracted from the gross revenue to arrive at the net revenue to BCPC. In current dollars, this net revenue totalled \$615 million for the 10 years studied.

Westcoast's estimated additional revenues to producers were based on the export volumes, plus fuel requirements, with a purchase price of \$1.12/GJ for 1980 escalating at 7.2 percent a year thereafter. In current dollars, the projected producers' revenue was \$229 million for the ten-year period.

Westcoast submitted that the benefits to Westcoast, the Province of British Columbia and the producers would be substantial even if maximum requirements occurred on only thirty days.

## Conclusions

The Applicant's analysis estimated the additional revenue to producers and the BCPC by summing the annual incremental revenues on a current dollar basis. It is my view that it is more appropriate to express such benefits in terms of their present value in constant dollars. For example, the net revenue to the BCPC over the ten-year period would have a present value of \$261 million in 1980 dollars, at a discount rate of 10 percent, which is significantly lower than the \$615 million estimated by the Applicant based on 120 days of additional export sales.

However, the present value of additional revenues is significantly higher than the project costs, including the capital expenditure and incremental annual operating costs. This conclusion would still apply were it assumed that the export customer took delivery of maximum contract volumes on 30 days during the winter season instead of each day over the 120 day period. On this basis, it is my view that the project has positive net economic benefits.

Although the Applicant has projected a volume of  $70.8 \times 10^3 \text{ m}^3$  (2.5 Bcf) for the year 1980-81, it appears that the threshold volume of  $42.5 \times 10^3 \text{ m}^3$  (1.5 Bcf) would be sufficient to cover the cost of service.



CANADIAN CONTENT

Westcoast estimated the Canadian content of the project to be 91 percent. The Applicant indicated that the non-Canadian content was accounted for largely by imported raw materials required to produce line pipe and by the need to import large diameter valves not manufactured in Canada.

Conclusions

I am satisfied with the estimates of Canadian content for this project.

#### FINANCING

Westcoast has estimated that the cost of the proposed looping would be \$21,582,000 including an allowance for funds used during construction of \$831,000.

The Applicant further stated that it proposed to finance the facilities initially by lines of credit it has with two Canadian chartered banks. The bank loans would be repaid during 1980 out of the proceeds of a proposed long-term debt issue.

#### Conclusion

I believe that Westcoast has the ability to finance the proposed facilities.

SUMMARY OF FINDINGS AND CONCLUSIONS

As Presiding Member, I have considered all of the evidence and submissions presented to me concerning this application and have expressed opinions in preceding sections of this report.

With respect to gas supply, I am satisfied that, on the basis of the evidence, Westcoast has adequate supply to meet its requirements.

My conclusion on domestic markets is that the forecast submitted by Westcoast is reasonable and that the additional looping facilities would enhance the Applicant's ability to meet the existing and growing demand of its domestic customers.

As far as the export markets are concerned, I am satisfied that Westcoast will provide additional winter service to its high priority customers, will regain some of its industrial sales and possibly make substantial sales during the summer months to a power plant. Because of the additional sales in the period of 1980-81, I am satisfied that the threshold requirement would be met starting in the period 1980-81.

I believe that there will be at least 30 additional days of maximum requirements during the winter period by both domestic and export customers, and that this period will be sufficient to justify the project.

Because of the additional winter service sales coinciding with the winter peak period, I believe that Northwest needs assurance that its contractual obligation to its customers during the winter period will be continuously met by a delivery of  $22\,922.9 \times 10^3 \text{ m}^3$  a day from Westcoast. In that way Northwest will not need to rely on gas storage facilities to protect its contractual obligations.

With respect to the design of the facilities proposed, I am satisfied that the facilities applied for would provide the capacity required to meet the domestic and export market requirements as forecast by Westcoast. I am satisfied, as well, with the general design of the facilities and with the estimated costs. I accept that Westcoast would have the ability to finance its looping project.



I anticipate no problems on right-of-way if an order were to be issued. Likewise, I am satisfied that the environmental impact of the project would be minimal provided that construction of the proposed facilities were carried out in accordance with the undertakings respecting environmental matters and in accordance with the environmental protection procedures followed by Westcoast in the past.

As far as the economic evaluation of the project is concerned, I accept that, with the demand as forecasted by Westcoast, there would be substantial net economic benefits from the project.

In my view, the level of Canadian content proposed by Westcoast for this project is reasonable.

On the basis of the evidence adduced and the submissions made at the hearing, and having taken into account all matters that appear to me to be relevant, I am satisfied that the pipeline facilities which are the subject of this application are and will be required by the present and future public convenience and necessity.

RECOMMENDATION

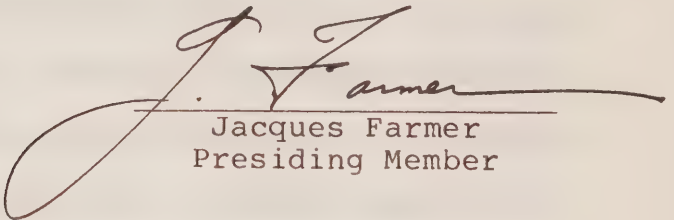
Westcoast requested an Order pursuant to section 49 of the National Energy Board Act for exemption from the provisions of sections 25 to 29 of the Act.

Having regard to the foregoing findings and conclusions, I recommend that the Board issue an Order to Westcoast pursuant to section 49 of the Act exempting the proposed additional pipeline for the transmission of gas in the Province of British Columbia, from the provisions of paragraph (a) of subsection (1) and subsection (2) of section 26, and sections 27, 28 and 29 of the Act, upon the terms and conditions set out in Appendix 3.

I am of the opinion that exemption from the provisions of section 25 of the Act is not necessary since the Applicant is a company within the meaning of the Act and I therefore recommend no exemption from the provisions of section 25.

I recommend that no exemption be granted from the provisions of paragraph (b) of subsection (1) of section 26, because I am of the opinion that the additional pipeline should be tested and subsequent "Leave to Open" Orders be issued.

I submit this, my report, to the National Energy Board, in accordance with section 14 of the Act. I respectfully recommend that it be adopted as the Board's own findings and decision on the application, as allowed under the said section.



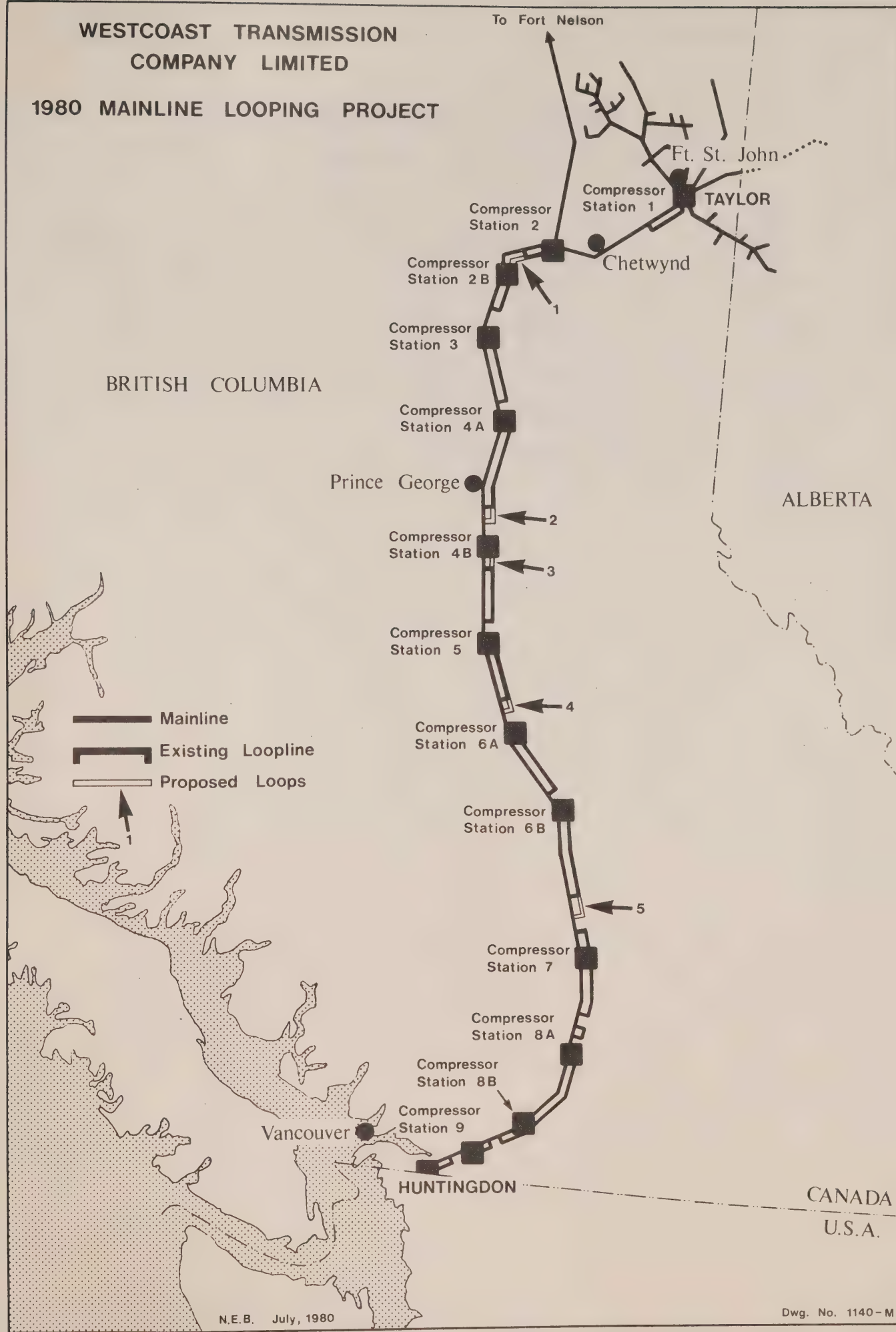
J. Farmer

---

Jacques Farmer  
Presiding Member

# WESTCOAST TRANSMISSION COMPANY LIMITED

## 1980 MAINLINE LOOPING PROJECT







Westcoast Mainline LoopingLocation of Facilities

<u>Station</u>	<u>Mile Post</u>	<u>Km</u>
2-2B	104.6 - 112.6	12.875
4A-4B	255.3 - 257.6	3.702
4B-5	261.3 - 266.6	8.530
5-6A	360-1 - 363.5	5.472
6B-7	456.6 - 460.6	<u>6.437</u>
TOTAL		37.016



TERMS AND CONDITIONS OF ORDER

1. The additional pipeline to be constructed pursuant to this Order shall be the property of and shall be operated by Westcoast.
2. (1) Westcoast shall cause the additional pipeline, in respect of which this Order is issued, to be designed, manufactured, located, constructed and installed, in accordance with those specifications, drawings and other design data as set forth in the application, or as otherwise ordered by the Board.  
  
(2) Westcoast shall cause no variation in the specifications, drawings, other design data and requirements described in subsection (1) hereof, to be made without the prior approval of the Board.
3. Westcoast shall, within six months of leave to open being granted, submit to the Board legal survey plans for the diversions required in the Pine River Loop and the Hihium Lake Loop, where new right-of-way is required.
4. Westcoast shall, unless otherwise authorized by the Board, cause the construction and installation of the additional pipeline to be carried out in accordance with its undertakings respecting environmental matters given in the evidence and in accordance with:
  - (i) Standard Environmental Protection Procedures in General Construction Specifications, and
  - (ii) Standard Environmental Protection Procedures in "Environmental and Ecological Requirements" Section of Construction Specificationas found in the "Procedures Manual for Environmental Engineering of Gas Pipelines for Westcoast Transmission Company Limited".
5. Westcoast shall, within six months of leave to open being granted, submit a report satisfactory to the Board describing the implementation of the undertakings and procedures referred to in the environmental portion of the Board's Reasons for Decision on the application by Westcoast respecting the additional pipeline. This report shall include:
  - (i) details of any deviation, and
  - (ii) an assessment of the effectiveness of the said undertakings and environmental protection procedures to prevent or mitigate any long-term effects of pipeline construction.



6. Westcoast shall implement a post-construction environmental monitoring program of the effects of pipeline construction and operation upon the environment. The program shall monitor those items specified in the environmental portion of the Board's Reasons for Decision on the application by Westcoast respecting the additional pipeline. The monitoring program shall be carried out for a period of three years after leave to open has been granted and Westcoast shall submit an annual report satisfactory to the Board for each of those years, describing the results of the monitoring program and the actions taken or which should be taken to prevent or mitigate any long-term effects of the additional pipeline upon the environment.
7. Westcoast shall cause the construction and installation of the additional pipeline, herein referred to, to be completed on or before the 31st day of January, 1981, unless upon application by Westcoast a later date is fixed by the Board.

